The Freshwater Trust®

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Potential Human Use Allowance Range

Total Maximum Daily Loads (TMDLs) in Oregon include an underlying cumulative effects analysis. Where a cumulative effects analysis exists (either as a supporting document for a TMDL, or as an independent analysis), it ensures that the cumulative temperature impact of all point and nonpoint source allocations does not exceed the human use allowance (HUA) of 0.3°C at a point of maximum impact (POMI) as described in OAR 340-041-0028(12)(b)(B). A river system does not necessarily retain all heat; the cumulative effects analysis accounts for the sources and losses of heat throughout the simulated river. The term attenuation is used to describe the heat balance, capturing all the sources and sinks of heat to the river. Depending on the applicable criteria for the Temperature TMDL, the analysis may be based on a scenario that utilizes Natural Thermal Potential (NTP) or a condition where the river is meeting the biologically-based numeric criteria (BBC).

I. Current Scenario: HUA Allocations With Heat Attenuation (Ambient River Temperature at NTP or BBC)

In performing the cumulative effects analysis for the mainstem Willamette Temperature TMDL, Oregon DEQ accounted for heat attenuation when allocating portions of the human use allowance to point sources. The analysis ensures that the cumulative impact of all point source allocations does not exceed 0.23°C, the portion of the HUA allocated to all point sources cumulatively, at any point along the river (Figure 1). The sum of all the individual allocations, without accounting for heat attenuation, is approximately 0.8°C.

Figure 4.148 Willamette River mainstem

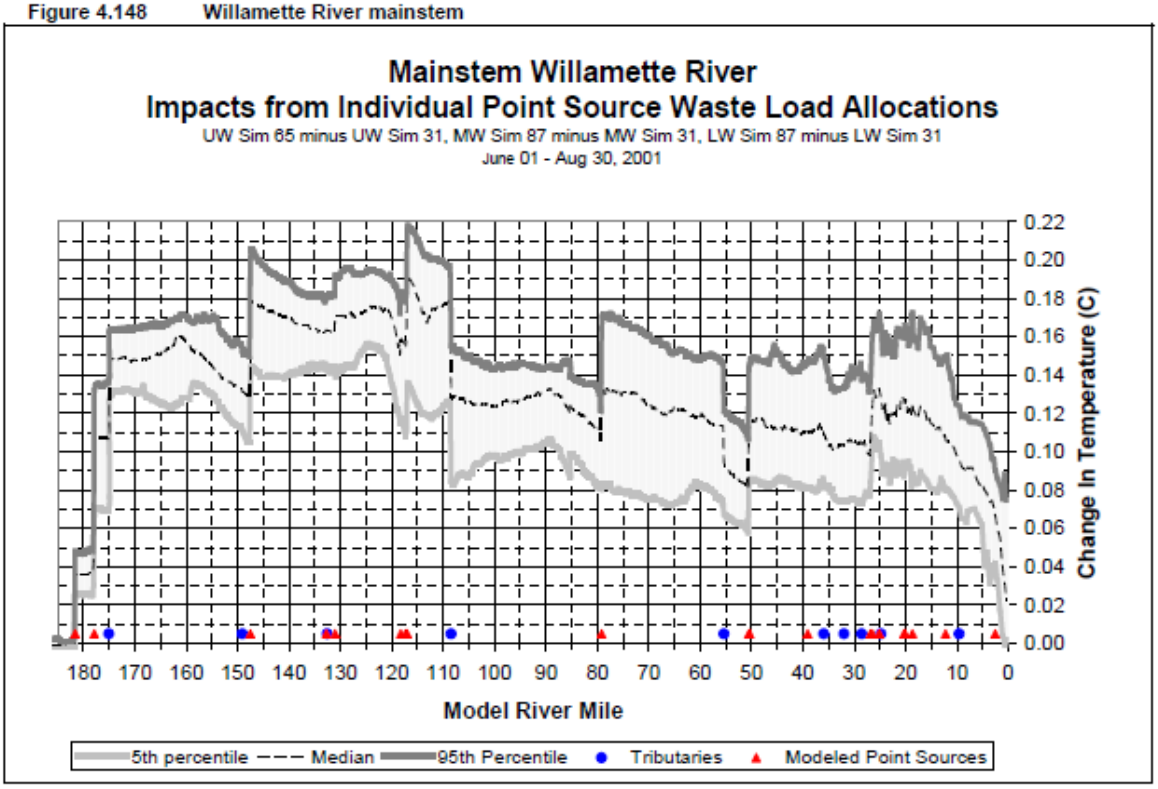

Figure 1 *(Figure 4.148 in the TMDL). Impact of the individual point source human use allowances that discharge into the mainstem of the Willamette River. Oregon DEQ, Willamette TMDL, at 4-208. The below table on pg. 2 of this document lists the point sources that correspond with the red triangles in Figure 1.*

Model River Mile	Willamette River Point Source / Tributary
182	U of O
178	MWMC
175	McKenzie River
149	Long Tom River
148	Georgia Pacific/Pope and Talbot
133	Evanite
133	Marys River
131	Corvallis WWTP
118	Albany WWTP
117	Wah Chang
117	Weyerhaeuser Albany
108	Santiam River
79	Willow Lake WWTP
55	Yamhill River
51	SP Newsprint
50	Newberg WWTP
39	Wilsonville WWTP
36	Molalla-Pudding River
29	Tualatin River
27	West Linn Paper
26	Blue Heron Paper
25	Tri-City WPCP
25	Clackamas River
20	Tryon Creek WWTP
20	Oak Lodge WWTP
19	Kellogg Creek WWTP
3	Siltronics

II. Worst-Case Scenario: HUA Allocations *Without* Heat Attenuation (Ambient River Temperature Not Considered)

If the cumulative effects analysis used to create the HUA allocations were re-evaluated using the biologically-based numeric criteria, the allocations given to point sources would change. Without conducting the additional cumulative effects analysis, the magnitude of the impact is unknown. It is possible, however, to determine the potential range of change that could occur. The current HUA allocations, as delineated in the Willamette TMDL, represent one bound to this range. The other bound to this range assumes that all heat is conserved, meaning there is no loss of heat from the waterbody. This conservative scenario assumes that no heat is lost from the river system (i.e. that all heat that enters the water from discharges is carried downstream. The allocations are based solely then on the heat load that is equivalent to the HUA). In this scenario, the sum of all the individual point source allocations thus cannot exceed the 0.23°C limit (the portion of the HUA that Oregon DEQ allocated to point sources in Mainstem Willamette Temperature TMDL).

Figure 2 illustrates these two HUA ranges in the Willamette Basin: 1) a HUA as currently allocated in the TMDL (0.8°C combined total), and 2) a proportionally reduced allocation that caps the sum of all point source allocations at 0.23°C. Under the second scenario, on the mainstem Willamette, each facility's HUA would be approximately 25% of its original size. Figure 2 illustrates the impact of these two HUA ranges on a facility that discharges into the mainstem of the Willamette River.

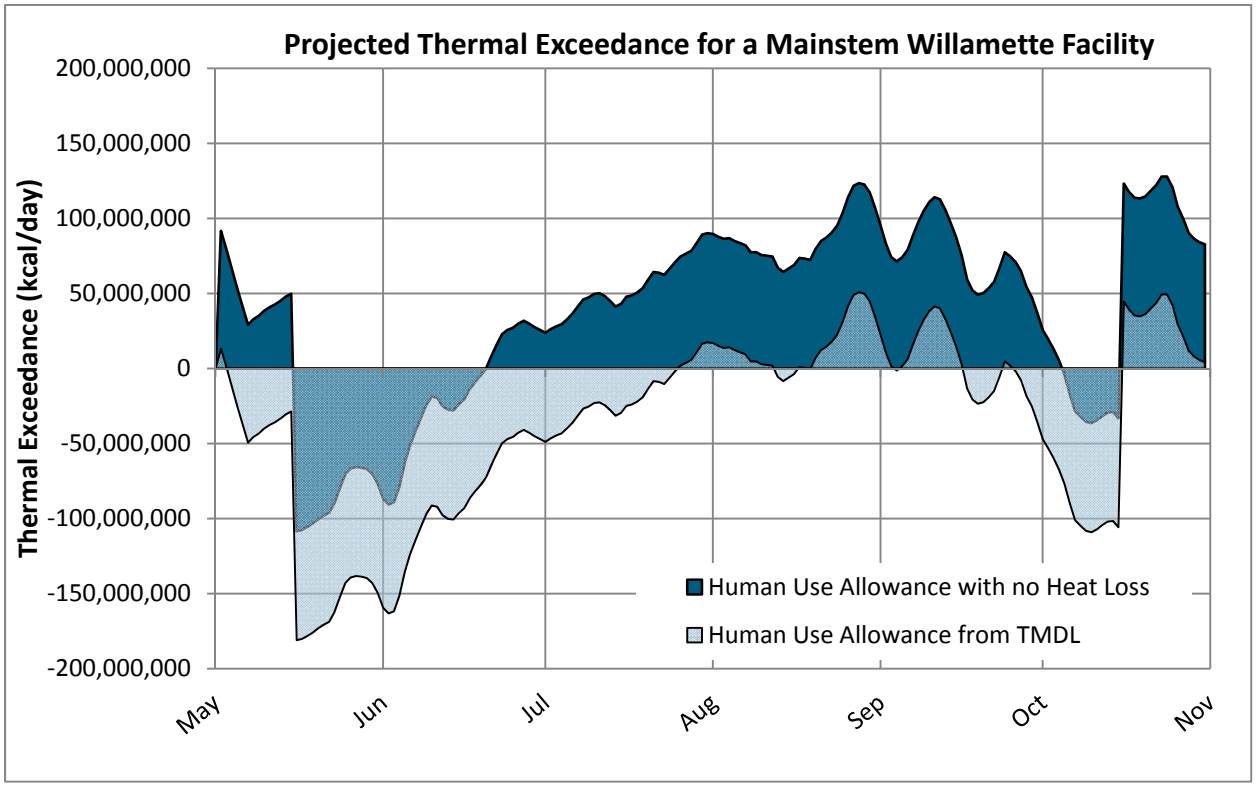

Figure 2. *Projected (future) thermal exceedance for a facility that discharges into the mainstem of the Willamette River. The graph illustrates two potential Human Use Allowance (HUA) scenarios. The "Human Use Allowance from TMDL" scenario (light blue) illustrates the facility's thermal exceedance using the biologically-based numeric criteria (BBNC) and the HUA allocation from the current TMDL. The "Human Use Allowance with*

no Heat Loss" scenario (dark blue) illustrates the facility's thermal exceedance using the BBNC and assuming that the cumulative HUA for the entire river does not take into consideration any heat loss.

Figure 2 illustrates the impact of the HUA range on a single facility. The graph only illustrates a single facility, but the general trend will be consistent between point sources: a smaller HUA allocation will lead to higher heat loads that need to be mitigated. If HUA allocations are reduced from their current allocations, facilities will need to deal with greater excess heat loads, either through water quality trading or by facility improvements. In the case of the facility illustrated in Figure 2, if a new HUA was allocated assuming no heat loss (i.e. assuming no evaporation and no conductive heat loss) from the system, their projected maximum thermal exceedance would increase by approximately 75 million kcal/day.

III. Alternative Scenario: HUA Allocations With Attenuation Using Biologically-based Criteria (Ambient River Temperature at BBC)

Additional modeling could be conducted to perform a cumulative effects analysis utilizing the biologically-based numeric temperature criteria as the ambient river temperature to account for attenuation. The outcome of this modeling would result in HUA allocations that fall within the range articulated above.